

Joseph Fleming <jfireeng@gmail.com> [hide details](#) Jul 13 (15 hours ago)

to	"Carolyn.DiGuseppi@uchsc.edu" <Carolyn.DiGuseppi@uchsc.edu>
date	Jul 13, 2007 6:31 PM
subject	Re: smoke detector study
mailed-by	gmail.com

Dr. DiGuseppi,

Thanks alot,

If it is too much to ask please check out stories I have done on smoke detectors at WBZ -TV and WTHR-TV.

I think I have discovered a problem that is responsible for hundreds of deaths per year.

I would greatly appreciate your opinion of my paper - if you get a chance.

You have already been extremely helpful.

Jay Fleming

On 7/13/07, Carolyn.DiGuseppi@uchsc.edu <Carolyn.DiGuseppi@uchsc.edu> wrote:

Dear Mr. Fleming

I can try my best to respond - it's been a few years so my memory of the details (beyond what is in the paper) is not that great. I have done a few analyses for you, pasted below. Please see responses below.

Good luck with your efforts!

Carolyn DiGuseppi

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From: Joseph Fleming [mailto:jfireeng@gmail.com]

Sent: Fri 7/13/2007 6:42 AM

To: DiGuseppi, Carolyn

Subject: smoke detector study

Dr. DiGuseppi,

My name is Jay Fleming. I am a Deputy Chief on the Boston Fire Dept.

I am also a big fan. I really appreciate your research into smoke detectors. (I am attaching some of my own research in this area)

Currently, The Mass State Building Code mandates photoelectric technology near kitchens and bathrooms, due to the nuisance alarm problem.

Based on anecdotal evidence from electricians who do not have to repeatedly go back to fix problems it has been a success.

There are a lot of studies that show the ion detectors to be much more likely to be disabled due to nuisance alarms. (I am attaching a link to a study from the UK. Your study in England suggested that photos are more likely to be disabled.)

Here are my questions. (Some of these were probably answered in your paper but I do not want to risk the possibility of misinterpretation.)

- 1) Does your research show that a "silence" button is not an effective mechanism for dealing with nuisance alarms?

Our results showed that having a pause button had a negative effect on function, all other aspects (type of battery, type of sensor, whether there was a smoker in the home) being equal. We also noted that ionization alarms with pause buttons and zinc batteries were more likely to have their batteries replaced and to have a report of the battery having been changed than those without pause buttons and with zinc batteries. We speculated that the alarms with pause buttons drew more power from the battery - this could be something inherent to the pause button or perhaps could be because without the pause, batteries were disconnected with false alarms, thus saving power if false alarms were not acknowledged. The battery remained disconnected for extended periods. These explanations are not that satisfactory, however, and I have no proof for them. Our results should be interpreted with caution in any case - many of the homes had high ceilings and therefore the pause button may not have been easily usable.

- 2) When the detectors were disabled were they likely to be disabled for different reasons? That is, were the ion detectors disabled mostly because of nuisance alarms while the photos were disabled because of low power chirping. (This would be important for the Mass Building Code since smoke detectors are required to be hard-wired the low power would not be an issue, while the nuisance alarms would still be an issue.)

We did not specifically ask why the alarm had been disabled so I cannot answer that question. Here are the data by alarm type and whether it had ever given a nuisance alarm while cooking (1=yes; 2=no); 3) has it ever produced a 'low battery' chirp (1=yes; 2=no); 4) has anyone ever changed the battery (1=yes; 2=don't know). Other causes of nuisance alarms were very rare. These data do show some differences: fewer false alarms with ionization zinc pause alarms, and, as stated in our paper, more chirps and battery changes with optical.

Alarm Type * AlarmCooking Crosstabulation

			AlarmCooking		Total
			.00	1.00	.00
Alarm Type	Ionization Zinc	Count	302	232	534
		% within Alarm Type	56.6%	43.4%	100.0%
	Ionization zinc pause	Count	335	203	538

		% within Alarm Type	62.3%	37.7%	100.0%
	ionization lithium pause	Count	125	103	228
		% within Alarm Type	54.8%	45.2%	100.0%
	optical zinc	Count	209	92	301
		% within Alarm Type	69.4%	30.6%	100.0%
	optical lithium	Count	142	76	218
		% within Alarm Type	65.1%	34.9%	100.0%
Total		Count	1113	706	1819
		% within Alarm Type	61.2%	38.8%	100.0%

Alarm Type * AlarmChirp Crosstabulation

			AlarmChirp		Total
			.00	1.00	.00
Alarm Type	Ionization Zinc	Count	485	49	534
		% within Alarm Type	90.8%	9.2%	100.0%
	Ionization zinc pause	Count	410	128	538

		% within Alarm Type	76.2%	23.8%	100.0%
	ionization lithium pause	Count	224	4	228
		% within Alarm Type	98.2%	1.8%	100.0%
	optical zinc	Count	243	58	301
		% within Alarm Type	80.7%	19.3%	100.0%
	optical lithium	Count	209	9	218
		% within Alarm Type	95.9%	4.1%	100.0%
Total		Count	1571	248	1819
		% within Alarm Type	86.4%	13.6%	100.0%

Alarm Type * ReplacedBatt Crosstabulation

			ReplacedBatt			Total
			.00	1.00	2.00	.00
Alarm Type	Ionization Zinc	Count	348	79	14	441
		% within Alarm Type	78.9%	17.9%	3.2%	100.0%

	ionization zinc pause	Count	313	146	11	470
		% within Alarm Type	66.6%	31.1%	2.3%	100.0%
	ionization lithium pause	Count	178	2	5	185
		% within Alarm Type	96.2%	1.1%	2.7%	100.0%
	optical zinc	Count	154	86	5	245
		% within Alarm Type	62.9%	35.1%	2.0%	100.0%
	optical lithium	Count	162	7	7	176
		% within Alarm Type	92.0%	4.0%	4.0%	100.0%
	Total	Count	1155	320	42	1517
		% within Alarm Type	76.1%	21.1%	2.8%	100.0%

3) Do you know if the testing standards in the UK allow for less sensitive detectors than in the US? In the mid 80's, UL changed to allow the manufacturers to make less sensitive detectors in order to reduce nuisance alarms.

I don't know the answer to that.

4) I thought it was interesting that within the same technology and looking at the open kitchen the following seems to occur

	ION WITH PAUSE		PHOTO	
	LITHIUM	ZINC	LITHIUM	ZINC
% ALARM MISSING	15%	12%	30%	18%
% BATTERY MISSING	2%	31%	12%	28%

Apparently, when taking out the battery is difficult they just take down the entire detector.

I agree, these data are suggestive, but again, we didn't ask why they did whatever they had done, and also, the contrast is not as situations and alarm types.

Any information would be appreciated.

Jay Fleming
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